

NOTES ON THE GENUS CLERODENDRUM (VERBENACEAE). XXXVI

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CLERODENDRUM Burm.

Additional & emended bibliography: J. A. Murray in L., Syst. Veg., ed. 14, 2: 577 & 578. 1784; Bartlett, Papers Mich. Acad. Sci. 6: 34. 1921; E. D. Merr., Philip. Journ. Sci. 21: 533 & 601. 1922; Wangerin, Justs Bot. Jahresber. 50 (1): 190, 206, 237, 240, & 247. 1930; Kanehira & Hatusima in Hatusima, Journ. Jap. Bot. 13: 677--679, fig. 2. 1937; Van Steenis, Act. Hort. Berg. 15 (2): 42. 1949; G. W. Long, Natl. Geogr. Mag. 103: 205. 1953; Harler, Gard. Plains, ed. 4, 23, 159, 167, 171, 251, & 453. 1962; Ganapaty & Rao, Indian Journ. Pharm. Sci. 47: 167--168. 1985; Dudley, Biosyst. Flor. Phylog. 1: 802 & 805--806. 1986; Rehd., Man. Cult. Trees, ed. 2, imp. 3, 802, 805--806, & 937. 1986; Mold., Phytologia 62: 452--486, 504--506, & 508--512. 1987.

CLERODENDRUM OHWI Kanehira & Hatusima

Additional bibliography: Mold., Phytologia 62: 486. 1987.

Leafblades basally cuneate or obtuse, fuscous-tomentellous on both surfaces; midrib hardly elevated above, prominent beneath; secondaries 4 or 5 per side, issuing at an angle of 50° from the midrib, arcuately joined at the margins; inflorescence cymose, terminal or subterminal, 8 cm. long, 5--7 cm. wide, rameose, fuscous-tomentose, the ramifications dichotomously furcate; bracts linear, 4--8 mm. long; primary peduncles 3--4.5 cm. long, 1--1.2 mm. in diameter; cyme ramifications 1.5 cm. long, 1 mm. in diameter; pedicels 1--1.2 cm. long; calyx obconic-campanulate, 13--15 mm. long, externally pubescent, internally glabrescent, apically 5-lobed, the lobes triangular, 5--6 mm. long, 4 mm. wide; corolla tubular-campanulate, 2.5 cm. long, very sparsely pilose above, the tube very slender, 2 cm. long, 1.5 mm. wide, the limb campanulate, 5-lobed, the lobes ovate-elliptic or ovate-oblong, 7--9 mm. long, 4--5 mm. wide, apically obtuse, marginally entire and ciliolate; stamens 4, inserted in the corolla-tube; filaments 3--4 cm. long, filiform, glabrous, long-exserted; anthers oblong, 2 mm. long, 1 mm. wide; style 4 cm. long; stigma very shortly 2-lobulate; ovary oblong-globose, 1.5 mm. long.

This species is based on *J. Ohwi* 1307 from Taroko, Karenkotyō, Taiwan, collected in April of 1933. The authors claim that "This is near *Clerodendron vanoverberghii* Merrill from Luzon, but differs from it in having much narrower leaves with shorter petioles, smaller inflorescences, much longer calyx and the about twice longer stamens. This also somewhat resembles [the] densely pubescent form of *C. trichotomum*, but is easily distinguishable from it by its smaller flowers with more patent calyx lobes and much stouter pedicels." A vernacular name is "birðo-kusagi".

Hsiao (1978) comments that "The type, from Hualien, Ohwi 1307

was not seen [by me]. According to the description this resembles the densely pubescent form of *C. trichotomum* but has smaller flowers, more patent calyx-lobes, and stouter pedicels. As no such plant has been collected since [on Taiwan], its actual existence remains to be proved."

Citations: MOUNTED ILLUSTRATIONS: Kanehira & Hatusima, Journ. Jap. Bot. 13: 678, fig. 2. 1937 (Ld--photo of type).

CLERODENDRUM OREADUM S. Moore, Journ. Bot. Brit. 45: 93 [as "Clerodendron"] 1907; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 69 & 95. 1936.

Synonymy: *Clerodendron oreadum* S. Moore, Journ. Bot. Brit. 45: 93. 1907.

Bibliography: S. Moore, Journ. Bot. Brit. 45: 93. 1907; Prain, Ind. Kew. Suppl. 4, imp. 1, 50. 1913; B. Thomas, Engl. Bot. Jahrb. 68: [Gatt. Clerod.] 69 & 95. 1936; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 49 & 91 (1942) and ed. 2, 116 & 183. 1949; Prain, Ind. Kew. Suppl. 4, imp. 2, 50. 1958; Mold., Résumé 143 & 452, 1959; Mold., Fifth Summ. 1: 234 (1971) and 2: 870. 1971; Mold., Phytol. Mem. 2: 223 & 540. 1980.

A climbing shrub; branches wide-spreading, quite foliose, at first minutely pubescent, later glabrous, decidedly sulcate; leaves whorled in 3 or 4's; petioles slender, 5-12 mm. long, puberulent; leafblades small, ovate-oblong, 3-7 cm. long, 2-3 cm. wide, apically cuspidate-acuminate, marginally entire, basally obtuse or subrotundate, membranous, glabrous on both surfaces, green in drying; midrib and 2 basal secondaries very conspicuous and giving the leaf a trinerved appearance, the remaining secondaries about 5 on each side, ascending, more or less conspicuous, wide-spreading; inflorescence laxly paniculate, short-pedunculate, terminal, sub-equaling the leaves, 4-6 cm. long, 4-5 cm. wide; peduncles 1.5-2 cm. long; cyme ramifications wide-spreading, slender, pubescent; bracts small, filiform, 2-3 mm. long, pubescent; pedicels shorter than the calyx; calyx rather small, turbinately-campanulate, 3 mm. long, pubescent, the lobes narrowly linear-lanceolate, 1 mm. long, apically acute; corolla white, externally puberulent, the tube slender, 6.5 mm. long, 1 mm. wide, twice as long as the calyx, the lobes short, oblong-ovate, 2 mm. long, 1.2 mm. wide, apically very obtuse; exserted portion of the stamens equaling the corolla-tube; anthers oblong, 1.5 mm. long; style slightly exserted, 8 mm. long; ovary globose, 1.25 mm. long.

This species is based on Bagshawe 1075 & 1123 from Toro, in the forest near Mpanga and on the Bigera River, Uganda, deposited in the herbarium of the British Museum. Of these two collections, Thomas (1936) has chosen the latter as the type.

Moore (1907) says that the species "Differs from *C. nuxioides* (*Siphonanthus nuxioides* S. Moore) in the small leaves obtuse or rounded at the base, the short inflorescences, much smaller calyx and corolla, the former pubescent, &c. It is nearer still to the plant named by Baker (Fl. Trop. Afr. v. p. 290) *Premna macrosiphon*, but which is, I venture to think, a *Clerodendron*; this, however, has

rusty stems, much larger leaves with rusty petioles, and larger lobes to calyx and corolla among other features."

Thomas (1936) comments that "Diese Art ist mir nur aus der Beschreibung bekannt; danach lehnt sie sich eng an die vorige [C. *buchholzii* Gürke] sowie an Nr. 57 [C. *nuxioides* (S. Moore) Thomas] an." He cites only the same two Bagshawe collections.

Citations: UGANDA: Bagshawe 1123 [Mo. Bot. Gard. Type Photo A. 852] (Gz--photo of type, N--photo of type).

CLERODENDRUM PALMATOLOBATUM Dop in Lecomte, Fl. Gén. Indo-chine 4: 866 [as "Clerodendron"]. 1935; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 59. 1942.

Synonymy: *Clerodendron palmatolobatum* Dop in Lecomte, Fl. Gén. Indo-chine 4: 866. 1935. *Clerodendrum palmatolobum* Dop ex Mold., Known Geogr. Distrib. Verbenac., ed. 1, 91 sphalm. 1942. *Clerodendrum palmatilobatum* Dop ex Mold., Phytologia 60: 141 sphalm. 1986.

Bibliography: Dop in Lecomte, Fl. Gén. Indo-chine 4: 851, 860, & 866. 1935; A. W. Hill, Ind. Kew. Suppl. 9: 68. 1938; Mold., Known Geogr. Distrib. Verbenac., ed. 1, 59 & 91 (1942) and ed. 2, 136 & 183. 1949; Mold., Résumé 175, 267, 273, & 452. 1959; Mold., Fifth Summ. 1: 306, 452, & 464 (1971) and 2: 870. 1971; Mold., Phytol. Mem. 2: 284, 288, 291, & 540. 1980; Mold., Phytologia 60: 141. 1986.

A shrub, about 3 m. tall; branches tetragonal, canaliculate, glabrous or puberulent; nodes annulate with a line of brown, woolly, interpetiolar hairs; leaves decussate-opposite; petioles elongate, to 30 cm. long, glabrous, canaliculate above; leafblades membranous, 15--25 cm. long, 15--20 cm. wide, palmately lobed, basally deeply cordate or hastate, with a narrow sinus, the lobes 5--7, linear-oblong, apically acuminate, marginally entire, with the basal sinus acute, sparsely hispidulous or subglabrous above, covered with very numerous, small, peltate glands or scales beneath, the middle lobe 12--18 cm. long and 5--6 cm. wide, the lateral ones decreasing in size regularly toward the leaf base; secondaries 5--7, palmate, prominent, arising from the leaf base, ascending to the center of the apex of each lobe; tertiaries numerous, perpendicular to the secondaries, recurved toward the margins; inflorescence paniculate, terminal, pyramidal, spreading, 15--20 cm. long, 10--15 cm. wide, dichotomously branched, the individual cymes racemiform; bracts foliaceous, the basal ones palmately lobed, the upper ones small and linear; pedicels slender, 3--4 mm. long; calyx campanulate, 3 mm. long, puberulent, the tube very short, the 5 lobes oval-lanceolate, 2.5 mm. long, apically acute; corolla hypocrateriform, vermillion-red, 1.5 cm. long, the tube slender-cylindric, 1 cm. long, the lobes obovate, 5 mm. long, spreading, ciliolate; stamens long-exserted, inserted in the throat of the corolla-tube; filaments glabrous; anthers oblong, with 2 parallel thecae; style slender, equaling the stamens; stigma shortly bifid; ovary glabrous.

This species is based on an unnumbered Poilane collection (probably no. 15302) from between La-khang-cheeung and Po-bang, in the province of Sre-Imbel, Cambodia. The vernacular name for the plant in Cambodia is "cam".

Collectors describe this plant as a shrub, 1--4 m. tall, the whole inflorescence red, the flowers with a slight odor, and have found it growing in evergreen forests or in sandy soil of open forests, at 400 m. altitude, in flower in March, April, and August. The corollas are said to have been "crimson" on Squires 828. The leaves are strikingly like those of *C. hastatum* (Roxb.) Wall., but differ in being conspicuously glandular-squamose beneath.

A key to help distinguish *C. palmatolobatum* from other Indochinese species of the genus will be found under *C. hahnianum* Dop in the present series of notes [60: 141--143].

Material of *C. palmatolobatum* has been misidentified and distributed in some herbaria as *C. paniculatum* L.

Citations: THAILAND: Larsen, Santisuk, & Warncke 3306 (Ld). CAMBODIA: Poilane 15302 (B--isotype). VIETNAM: Annam: Squires 828 (Bz--20159, Mu, N, N, S, W--1702741).

CLERODENDRUM PANICULATUM L., Mant. Pl., imp. 1, 1: 90. 1767 [not *Clerodendron paniculatum* Perr., 1824].

Synonymy: *Clerodendrum paniculatum* Retz., Nom. Bot. 155. 1772. *Volkameria angulata* Lour., Fl. Cochinch., ed. 1, imp. 1, 2: 389. 1790. *Caprifolium paniculatum* Noronha, Verh. Batav. Genootsch. Kunsten 5: 9. 1790. *Clerodendrum foliis quinquelobis, denticulatis, glabris; panicula brachiatâ, axillis lanatis* Wahl. ex Poir. in Lam., Encycl. Méth. Bot. 5: 167 in syn. 1804. *Clerodendrum foliis lobatis, serratis; panicula amplissimâ* L. ex Poir. in Lam., Encycl. Méth. Bot. 5: 167 in syn. 1804. *Clerodendrum pyramidale* Andr., Bot. Repos. 10: pl. 628. 1810. *Clerodendrum paniculatum* Willd. ex R. Br. in Ait., Hort. Kew., ed. 2, 4: 63. 1812. *Clerodendron paniculatum* L. ex Edwards, Bot. Reg. 5: pl. 406. 1819. *Clerodendron pyramidale* Andr. apud Ker-Gawl in Edwards, Bot. Reg. 5: pl. 406 in syn. 1819. *Clerodendron paniculatum, foliis cordatis, quinquelobatis subdenticulatis glabris; summis saepius indivisis, panicula brachiatâ, corollae tubo calycem multoties superante Brown* ex Ker-Gawl in Edwards, Bot. Reg. 5: pl. 406 in syn. 1819. *Clerodendron splendidum* Wall., Numer. List [49], no. 1803 hyponym. 1829; Schau. in A. DC., Prodr. 11: 668 in syn. 1847. *Clerodendrum splendidum* Wall. in Griff., Notul. 4: 169. 1854. *Clerodendrum pyramidale* Wall. ex Maxim., Bull. Acad. Imp. Sci. St.-Petersb. 31: 86 in syn. 1886. *Cleianthus coccineus* Lour. ex Gomes, Mem. Acad. Sci. Lisbon Cl. Sci. Mor. Pol. Bel.-Let., ser. 2, 4 (1): 28. 1888. *Clerodendron paniculata* L. ex Matsum., Ind. Pl. Jap. 2 (2): 532. 1912. *Clerodendron paniculatum* Menninger, 1960 Price List Flow. Trees [3] sphalm. 1960. *Clerodendrum splendidum* Wall. ex Liu, Illustr. Nat. Introd. Lign. Pl. Taiwan 2: 1217 sphalm. 1962. *Clerodendrum paniculata* Perry, Fls. World 304 & 313. 1972. *Clerodendron paniculatus* L. ex Mold., Phytologia 26: 371 in syn. 1973. *Clerodendrum kaempferi* sensu Moldenke ex Hsiao, Fl. Taiwan 4: 423 in syn. 1978 [not *Clerodendron kaempferi* (Jacq.) Sieb., 1830]. *Clerodendron panniculatum* L., in herb. *Clerodendron paniculatum* L., in herb.

Bibliography: L., Mant. Pl., imp. 1, 1: 90 (1767) and imp. 1, 2: 515. 1771; Retz., Nom. Bot. 155. 1772; Reichard in L., Syst.

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Illustrations: Andr., Bot. Repos. 10: pl. 628 (in color). 1810; Ker-Gawl in Edwards, Bot. Reg. 5: pl. 406 (in color). 1819; Loud., Encycl. Pl. 522, fig. 8699. 1829; Geel, Serr. Bot. Cl. 2: 14 (in color). 1832; Reichenb., Fl. Exot. 3: pl. 208 (in color). 1835; Lindl., Gard. Chron., ser. 1, 5: 535. 1845; Bocq., Adansonia, ser. 1 [Baill., Rec. Observ. Bot.] 2: [Rév. Verbenac.] pl. 3, fig. 29 (1862) and 3: pl. 7. 1863; W. Hook., Curtis Bot. Mag. 116 [ser. 2, 46]: pl. 7141 (in color). 1890; "W. W.", Garden Lond. 42: 562/563, pl. 889 [as "kaempferi"] (in color). 1892; H. F. MacMillan, Trop. Gard. Plant., ed. 3, 110 (1925), ed. 4, 105 (1935), ed. 5, imp. 1, 105 (1943), ed. 5, imp. 2, 105 (1946), ed. 5, imp. 3, 105 (1948), ed. 5, imp. 4, 105 (1949), and ed. 5, imp. 5, 105, 1952; G. W. Long, Natl. Geogr. Mag. 103: 205 (in color). 1953; H. F. MacMillan, Trop. Plant. Gard., ed. 5, imp. 6, 105 (1954), ed. 5, imp. 7, 105 (1956), and ed. 5, imp. 8, 105. 1962; Liu, Illustr. Nat. Introd. Lign. Pl. Taiwan 2: 1217. 1962; Graf, Exotica 3: 1481 [as "C. buchanani" & "C. paniculatum"]. 1963; Corner & Watanabe, Illust. Guide Trop. Pl. 756. 1969; J. F. Morton, Exot. Pl. 120 (in color). 1971; Mold. in Woodson, Schery, & al., Ann. Mo. Bot. Gard. 60: 140, fig. 15. 1973; J. F. Morton, 500 Pl. S. Fla. 55. 1974.

A bushy perennial herb or erect bushy shrub or subshrub, often simple or subsimple, to 3 m. tall, often woody only at the base;

stems and branches to 3 cm. in diameter, stout, medullose or hollow, obtusely tetragonal, usually deeply sulcate in drying, minutely pulverulent-puberulent or glabrate; nodes with a broad band of tomentose hairs; leaves decussate-opposite, gradually smaller upwards; petioles 12--35 cm. long, minutely pulverulent-puberulent or glabrate; leafblades thin-chartaceous or membranous, roundish to ovate or broadly ovate, 6--40 cm. long, 7--38 cm. wide, usually nearly as wide as long, basally subrotund to cordate, deeply 3--7 [mostly 5] -lobed or the uppermost often unlobed, basally palmately veined, the lobes triangular-ovate, apically acute or apiculate to acuminate, spreading, variable in size, wilting rapidly, marginally remotely apiculate-denticulate to shallowly crenate-dentate or entire and with conspicuous glands 3--8 mm. apart, bright- or dark-green and usually shiny above, lighter and dull beneath, pulverulent and minutely strigillose above or glabrate, densely squamulose with small, whitish, orbicular, peltate scales and punctate beneath, glabrous between the scales or pubescent only on the venation, the central lobe mostly large and ovate, the others much smaller and triangular; inflorescence axillary and terminal, the axillary cymes mostly confined to the uppermost leaf-axils, the cymes long-pedunculate, 9--13 cm. long and 3--7 cm. wide, many-flowered, building up often large and thyrsoid, much-branched, terminal panicles to 45 cm. long and wide, 1--4 times dichotomous, composed of 4--16 pairs of cymes, the ultimate divisions often racemiform, the ramifications divaricate-ascending, conspicuously bracteate, rose-red, minutely pulverulent-puberulent or glabrate throughout but often tomentose at the sympodial nodes; peduncles 1.5--12 cm. long, mostly red or reddish, exactly similar to the adjacent stems in shape and texture; pedicels rose-color, subfiliform, 4--15 mm. long; foliaceous bracts large, a pair subtending each of the larger pairs in inflorescence ramifications, ovate-elliptic, unlobed or obscurely 3-lobed, similar to the leaves in other respects but smaller; bractlets and prophylla linear, 1--10 mm. long, puberulent; flowers slightly odorous, red and glandulose in bud; calyx red or orange-red, campanulate, about 13 mm. long, short-pubescent, divided nearly to the base, the tube 3--5 mm. long, the segments erect or spreading, triangular, apically acute, dorsally punctate; corolla hypocrateriform, orange-red to scarlet, externally short-hairy, the tube slender-cylindric, 1--2 cm. long, the limb spreading, 5-lobed, the lobes oblong, 6--8 [or 12] mm. long, spreading, paler, separated in the throat by white streaks, the posterior pair shorter and narrower than the others; stamens 4, orange-red or red, exserted 2.5--3.5 cm. during anthesis, curved; filaments very slender; style red, 4 times as long as the corolla-tube, exserted about 2/3 as far as the stamens; stigma minutely bilobed; ovary glabrous; fruit drupaceous, small, at first green, then greenish-blue or bluish to black, globose, externally glabrous, more or less enclosed by the persistent fruiting-calyx.

This is a spectacularly showy plant native to southeastern Asia from India, Bangladesh, and the Andaman & Nicobar Islands eastward through Burma, Thailand, and Indochina to Malaya and Indonesia, north into China and Taiwan. It is very widely cultivated in all

warm regions, where it often escapes and becomes naturalized, in greenhouses as specimen plants elsewhere.

Linnaeus, in the original description of the species (1767) states merely, in lieu of designation of a type: "Habitat in India" and gives no earlier author or collector citations, so the specimen in his herbarium in London should be regarded as the type. I examined this specimen many years ago -- it is in genus 810, *Clerodendron* [spelled thus on the outside cover, but *Clerodendrum* on the inside cover], sheet no. 5, inscribed "*paniculatum*" in Linnaeus' own handwriting and also "Juan bonge" in his hand [perhaps a vernacular name?]. The species is a member of the Section *Squamata* Schau.

Merrill (1935) states that "Loureiro's description [of *Volkameria angulata*] is an excellent one and it conforms to the characters of the Linnaean species [*Clerodendrum paniculatum*]. His type is preserved in the herbarium of the Paris Museum and it has been identified by Desvaux as *Clerodendrum paniculatum* Linn." Loureiro (1790) notes: "Habitat ubique in collibus, & in hortis minus cultis in Cochinchina". It may be noted, in passing, that Clemens & Clemens 3203 is a topotype of the Loureiro species, having been re-collected at the type locality. Morren (1845) places *Volkameria angulata* Lour. in the synonymy of *Clerodendrum squamatum* Vahl [now known as *C. kaempferi* (Jacq.) Sieb.] with a question, but I agree with Desvaux and Merrill that it definitely belongs in the synonymy of *C. paniculatum* L. instead.

The *Volkameria diversifolia* Vahl and *Clerodendron diversifolium* Vahl, sometimes included in the synonymy of the typical form of this species, are now regarded as *C. paniculatum* var. *diversifolium* (Vahl) C. B. Clarke, which see. The *C. paniculatum* of Perrotet, referred to above, is a synonym of *C. intermedium* Cham.

It should also be noted here that Nemnich (1791) reduced what he called *Volkamaria* [sic] *multiflora* Burm. to the synonymy of *Clerodendrum paniculatum* L., but, actually, Burman's binomial belongs in the synonymy of *C. phlomidis* L. f.

Among bibliographic errors in the literature may be mentioned that Hallier (1918) dates the Miquel (1858) reference as "1856". Hsiao (1978) dates the Linnaeus (1767) reference as "1768", but pages 1 to 142 of the work in question were actually published in October of 1767.

Collectors have encountered *Clerodendrum paniculatum* in deciduous and dry evergreen forests, bamboo forests and swamp forests, in open places in evergreen forests, on grassy slopes shaded by tropical forests, in old clearings and waste ground, along roadsides and fencerows, in scrub jungles, at forest margins, along streams, in hedges, in open fields and marshland, on granitic hills and hill-slopes, in village thickets, on railroad embankments, in betel-nut groves and rubber plantations, in open places along rivers, in "cascade forests on limestone", in shaded bamboo-deciduous forests and thickets, and in moist or wet places in general in either shade or bright sun, at altitudes of sealevel to 1200 m., in anthesis from January to November, and in fruit in July, September, and October.

Sinclair reports the species rare along roadsides in Singapore; Clemens found it frequent or fairly frequent in thickets in Annam [Vietnam]. In Thailand it is said by Bunnak to be common in evergreen jungles. Squires refers to it as "a widely distributed ornamental" in Annam; Saldanha says that it is "a locally common under-shrub" in Mysore (India). In Sri Lanka it has been reported by Koyama as "locally abundant in forest among rubber plantings", Gould found it "frequent on stream banks at forest margins", and Amaratunga refers to it as "an escape, now a bad weed in moist or wet low country"; Mueller-Dombois describes it as "a commonly cultivated shrub, growing wild in large groups along roadsides".

As to flowering, Chevalier (1919) says that in Vietnam it blossoms from April to September; Dournes (1973) says that it flowers in the "dry season", but in Panama Coats (1978) avers that it blooms "principally in the rainy season". Backer (1916) reports that in Java it blooms from September to April, while Blume (1826) gives "toto anno" as its blooming season. In England, according to Syng (1956), it blooms from July to October.

Moninger, on Hainan Island, says of this plant: "especially fond of hedges, an herb 1--2 m. tall, the flowers bright-red, the fruit [a] greenish-blue berry, plant red for a long time from beginning of flowering to end of fruiting." Its vernacular name there, "baen zitang", means "100 days red". The fruit, of course, is a drupe, not a berry.

The color of the corollas is described as "red" on Beusekom & al. 1922, Bunnak 161, Charoenphil & al. 4116, Gould 13588, Gressitt 45, Køie & Olsen 1440, Larsen & al. 105 & 1356, Ream 543, Saldanha 13461 & 13681, Sinclair 4999, Sumithraarachchi DBS.422, and Wood 743, as "dark-red" on Boonchuai 1129, as "brick-red" on Amaratunga 1848, Liger & al. 32355, and Moninger 79, "orange-red" on Amaratunga 2138, Maxwell 75-444, and Moldenke & al. 28335, "bright-red" on Cunniff 47, Stevens 453, and Sumithraarachchi DBS.509, "scarlet-red" on Moldenke & al. 28120, "deep-red" on Moldenke & al. 28257, "orange" on Geesink & Santisuk 5297 and Shimizu & al. T.7838, "pale to red-orange" on Tyson 4207, "dark-orange" on Ebinger 40, "scarlet" on Moldenke & al. 28333 and Ream s.n., "bright-scarlet" on Squires 150, "deep-orange or deep orange-red" on Koyama 13553, "somewhat washed-out red" on Gillis 11035, "orange-red, deeper orange-red toward the center" on Amaratunga 712, "tube red-orange, lobes light-orange" on Blum & Kimmel 2281, "tube orange-red, lobes incarnately orange, throat white inside" on Geesink & al. 6619, and "base of tube reddish-orange, rest orange, throat reddish-orange" on Amaratunga 2291. Peale describes the plant as "An erect unbranched herb 42 inches tall, the sepals approximately RHS [Royal Horticultural Society Color Chart] Capsicum Red 715, corolla-tube Indian Orange 713, corolla-lobes Carrot Red 612/1 distally, but same as the tube proximally".

Dietrich (1842) gives the native land of *C. paniculatum* as "Java et Cochinchina"; Miquel (1860) lists it from Banka and western Sumatra; Voss (1895) gives its distribution, as known to him, as the East Indies, Cochinchina, and Java; Briquet (1895) claims that it

is distributed "in Vorder- und Hinterindien, sowie in Archipel weit verbreiten". Brandis (1906) gives the distribution as "Pegu, Tenasserim, Malay Peninsula, Thailand, Cochinchina, China, and Taiwan. Woodrow (1910), amazingly and incorrectly, gives its original home as "East Persia". Ridley (1911) gives the distribution as "Siam and Malaya"; Hallier (1918) apparently knew it from Taiwan, Hainan, Thailand, Cochinchina, Lower Burma, Malacca, Penang, Singapore, Sumatra, eastern and western Java, and Ternate, citing Raap 617 from Java and Reinwardt 1594 from Ternate.

Merrill (1922) cites Castillo 598 from level land near the sea-shore in Sabah, asserting that this constitutes a new record for Borneo, and giving the species' overall distribution, as known to him at that time, as Burma, Thailand, Cochinchina, and southward to the Malaya Peninsula, Java, and Ternate. Ridley (1923) remarks that it is difficult to determine now where the plant is actually native in Malaya because "pieces are carried about by Sakai girls, who wear them in their hair, and apparently plant them in their camps".

Fletcher (1938) gives the distribution, as known to him, as Burma, Laos, Annam, Malay Peninsula, Sumatra, Hainan, Java, and Taiwan, citing from Thailand the following collections: Collins 210, 1475, & 2831, Garrett 1010, Keith s.n., Kerr 513, 762, 4436, 9072, 10739, & 15616, Lakshnakara 439 & 875, Marcan 414 & 2383, Put 31, Schomburgk 249, and Winit 425. He also records it as cultivated in Thailand.

Ruiz-Terán, in Venezuela, says of it: "Arbusto erecto, ramificado, 1,5 m., introducido y cultivado como ornamental. Tallo verde intenso, las caras virtualmente reducidas al surco medial, las aristas gruesas, obtusas o redondeadas. Hojas cartáceas, más o menos lobadas, verde intensas por la haz, más claras por el envés. Panículas de cimas, terminales, muy vistosas, 30--40 cm. de largo; ejes amarillo verdosos a verde amarillentos. Cáliz rojo intenso. Corola con tubo rojo intenso y limbo rojo anaranjado a rojo escarlata. Filamentos + estílo rojo escarlatas a morado rojizos."

Long (1953) records (and pictures) the species from Kuala Lumpur, Selangor (Malaya) and avers that it occurs "from south China to the Moluccas", noting that the Malays "use its essence as an elixir". Syngue (1956) gives its original home as eastern tropical Asia; Ker-Gawl (1819), Sweet (1827), MacMillan (1943), and Hundley & Ko (1961) claim that its origin was in Java, but Backer & Bakhuizen (1965) report that in Java its pollen is always "badly developed" and no fruit has yet been observed there although it grows there in shaded places and forests in the western, central, and eastern portions of the island and is also cultivated there as an ornamental.

Burkill (1966) gives the species' known distribution as from Burma and southern China, throughout the Malay Peninsula, to Java and Ternate. The Baileys (1976) regard it as native to Southeast Asia; Raeuschel (1797) and Linnaeus (1767) regarded it as only from India; Poiret (1804) said it was from "les Indes orientales". Griffith (1854) lists the species [as *C. splendidum* Wall.] from Mergui, citing Mergui Herb. 78, growing there "in ruderatis". Wallich's original collection of what he called *C. splendidum* was from Tavoy in Burma.

Hsiao (1975) tells us that in Taiwan *Clerodendrum paniculatum* is "common in thickets and waste places at low altitudes throughout the island", citing Fauri 300, Furukawa s.n., Gressitt 45, Sasaki 31416, and Wilson 9901 and comments that the species is "Widely distributed from China to Malaysia".

López-Palacios (1976) cites López-Palacios & Idrobo 3708 as cultivated in El Valle, Colombia; in his 1974 work he cites Ruiz-Terán & al. 10864 as cultivated in Venezuela. Chin (1977) reports the species cultivated in Singapore, while Croat (1978) found it cultivated on Barro Colorado Island, Panama, citing Croat 7000, giving its nativity as "Asia" but "cultivated in Europe and in the American tropics and subtropics. In Panama known only from tropical moist forest in the Canal Zone", where, he states, "no fruits have been seen". Fosberg & al. (1979) record it from Guam, Palau, Kotor, and Ponape in the Marianna and Caroline Islands.

Ker-Gawl (1819) asserts that the species was introduced into cultivation in England in 1809 from "Pulo Pinang (Prince of Wales Island" [=Penang, Malaya]. An author in The Garden (London) in 1892 notes that "*C. paniculatum* was in cultivation [in England] fifty years ago, and after a long absence was again introduced to Kew from China in 1889, and flowered in the stove in November.....The plant flowers freely, and is in every way a useful stove shrub. It is a native of various parts of India as well as China."

Bailey, in a personal communication to me in 1935, stated that it was at that time handled for the horticultural trade only by "Singapore" and "Taihoku". Menninger offered it to the gardeners in Florida in 1960 and for some time thereafter; Voigt (1845) found it in cultivation in the suburbs of Calcutta, India; Gledhill (1962) records it as cultivated in Sierra Leone.

Nair & Rehman (1962) describe the pollen (on the basis of *Natl. Bot. Gard.* 4164, slide 2630, from Calcutta) as "Spheroidal, size 70 mu. Apocolpium diameter 42 mu. Exine 9 mu thick. Ectine surface spinulate. interspinal area faintly granulate." Huang (1972) describes the grains as 6-colpate (pericolpate), 53--57 mu wide, the colpi 22--28 x 2 mu, on the basis of Huang 5507 from Taiwan.

Malaviya (1963) reports the presence of stone-cells in this species. Gibbs (1974) reports syringin doubtfully present in the stems and the HCl/methanol test negative. Fasciated inflorescences can be seen on Backer 18851 and on Koorders 29812b.

Hansford (1961) records the fungus, *Meliola clerodendri*, on this host in Sierra Leone, based on Deighton 1062. Hirata (1966) found the species infested by *Erysiphe cichoracearum* in Mauritius, while Batista & al. (1969) report the leaves attacked by *Didymella sphærelloides* Sacc. & Syd. in Brazil.

Corner (1952) tells us that, as in most members of this genus, the flowers of *Clerodendrum paniculatum* "are pollinated by butterflies and bees which suck the honey [nectar] from the base of the corolla-tube. In most species the stamens and style project from the lower side of the flower so that the pollen is carried on the underside of the insect. The flowers last more than one day: the stamens project first then curl back under the flower and leave the

style in position."

As to other economic uses of *C. paniculatum*, besides cultivation for ornament, Crevost & Pételot (1934) report it is "Utilisée contre les pertes blanches" [=leucorrhea]. Bartlett (1921) implies that it is the chief "summoner of spirits" in magic ceremonies in north-central Sumatra and asserts that its vernacular names in Malaya indicate that it is also so employed there. According to Skeat (1900) it is one of the plants used in making the leafy brush used for sprinkling the consecrated rice-gruel (*tēpong tawar*) in wedding ceremonies, in the blessing of fishing-stakes, and in the "taking of the rice-soul". Burkill (1935) reports that the Malays "infuse it and drink the infusion as a purgative, and apply it externally upon distended stomachs". Maxwell (1906) states that it is employed as an elephant medicine which is supposed to render elephants more "confident, brave, and protected from harm".

Harler (1962) asserts that this species will thrive in poor soil and that in India it is used for cut flowers and for background planting in rock gardens. Greensill (1966) recommends that it be grown in clumps in full sun exposure or in partial shade, remarking also that it "cuts easily", i.e., can be used as cut flowers. Mac Millan (1943) asserts that it is usually propagated by cuttings. Apparently this is the method of its propagation in regions where it fails to produce fruit or set seed.

Firminger (1918) avers that the corollas of what he calls *C. pyramidale* are "of rather a pallid crimson, not so brilliant" as in the true *C. paniculatum*. He notes that it, also, "is most easily propagated by cuttings of the young shoots, which soon become handsome plants." Ridley (1915), in speaking of *C. citrinum* Ridl., says that his species is "Allied to *C. paniculatum*, Linn. differing in the colour of the flowers, which are pubescent and the cuneate leaf base".

P'ei (1932) comments that "The fragmentary material of *Clerodendron darranii* Lévl. and of *C. Leveillei* Fedde which I have examined in the Herbarium of the Arnold Arboretum, indicates their close alliance to or identity with *Clerodendron paniculatum* L." These Leveille names are now regarded, however, as representing *C. japonicum* (Thunb.) Sweet, which see.

Vivekananthan (1968) asserts that, in his opinion, *C. paniculatum* "Comes near to *C. petasites* (Lour.) A. Meeuse (*C. viscosum* Vent.) but differs in having its leaves ovate, 3--5 lobed, with prominent round glands beneath; petioles connected by a dense ring of hairs and in having red flowers; distributed on Andaman & Nicobar Is., Burma, China, Cochin China, Formosa, Java, Malaya & Siam... In India it has not been reported so far in any of the floras" -- however, a collection by J. W. Helfer (no. 217) made in 1836--1838 in Bengal around the city of Calcutta is deposited in the Central National Herbarium in Calcutta. A recent collection has been made near plantations in the Peermade Hills and cited are *Vandiperiyar* s.n., Vivekananthan 20380 & 23970, and Naithani 24684 from Kerala.

Common and vernacular names reported for *Clerodendrum paniculatum* are: "bach dōng nū", "baeh zitāng", "bhang be:n". "bunga mara" [=

danger flower], "bunga tinggal", "cây vây", "danger flower", "gefiederte Losbaum", "gepluimde lotboom", "higiri", "hoa mồ trăng", "juan bonge", "kambang boegang", "kambang bugang", "leñg-chùn-hoe", "malang beranjam", "nom sawan", "nom swan", "nom-zwan", "pagoda flower", "pagoda-flower", "pangil-pangil", "panicled clerodendron", "pan-letwah", "panyin", "péh-léng-chún-hoe", "pemanggil", "pengkilai", "pepangil", "peragu paniculé", "pingdang", "red pagoda", "red pagoda flower", "rispenblütiger Losbaum", "ryūsenkwa", "ryūsen-kwa", "sarang banoea", "scarlet glorybower", "sépangil" [=the summermoner of spirits], "sapanggil", "sima-higiri". "si panggil", "si panggil eme", "tabut", "vây", and "warudogong".

Keys to help distinguish *C. paniculatum* from other Chinese species will be found under *C. canescens* Wall. and *C. henryi* P'ei in the present series of notes [58: 416 and 60: 180--181], from other Taiwan species under *C. intermedium* Cham. [60: 276], from other Indian species under *C. griffithianum* C. B. Clarke [60: 135--136], from other Indian & Hawaiian species under *C. indicum* (L.) Kuntze [61: 23--25], from other Indochinese species under *C. hahnianum* Dop [60: 141--143]. from other Indonesian species under *C. klemmei* Elm. [61: 410--415], from other Thailand species under *C. inerme* (L.) Gaertn. [61: 88--95], and from other cultivated taxa under *C. bethunianum* Low [58: 195--198].

Maximowicz (1886) cites Hooker & Arnott s.n. from the Ryukyu Islands, Oldham 395 from Taiwan, and Wallich s.n. from Penang, giving an additional distribution as "India trans Gangem et insulae..Java". He comments that "Planta formosana flore re incipiens huc ducenda videtur, quamvis folia floralia indivisa, quae in iconibus et spec. malo Wallichii lobata sunt, et corollae tubus calyce duplo tantum longior, neque, ut a Schauero descriptus, calycem 4-plo superans, sed hoc sane ob corollam juvenilem."

Williams (1905) cites Schomburgk 249 from Thailand. Li (1963) cites from Taiwan: Faurie 300 & 403, Ford s.n., Furukawa s.n., Gressitt 45, Hancock 49 & s.n., Ito s.n., Makino s.n., Maries s.n., Nagasawa 103, Oldham 395, Owatari s.n., Raam 543, Sasaki 21416, Suzuki s.n., Swinhoe s.n., Tanaka 106, Tanaka & Shimada 10974, Wilford 544, and Wilson 9901.

The Herb. Houlluyn s.n., cited below, does not bear any indication on its accompanying label that it represents cultivated material, but I am assuming that it does.

Material of *C. paniculatum* has been misidentified and distributed in some herbaria as *C. bethunianum* Low, *C. bungei* Steud., *C. citrinum* Ridl., *C. fallax* Lindl., *C. fragrans* Vent., *C. intermedium* Cham., *C. japonicum* (Thunb.) Mak., *C. kaempferi* (Jacq.) Sieb., *C. koshunense* Hayata, and *C. squamatum* Vahl. On the other hand, the Huang 1537, distributed as *C. paniculatum*, actually is *C. canescens* Wall., while Burkhill 13949 and Furtado s.n. [Lawn M, Nov. 18, 1927] are *C. citrinum* Ridl.; Steward & Cheo 816 is *C. colebrokianum* Walp.; Blinnemeijer 3110, Tsang & al. 7674, and Walker 7450 are *C. intermedium* Cham.; Chiao 1495 and Herb. Univ. Nanking 14694 are *C. japonicum* (Thunb.) Sweet; Blinnemeijer 3756, Chung 1672, Herb. Canton Chr. Coll. 7284, Herb. Ling. Univ. 15524 & 16847, Katsumada 21952, Mc

Clure 771, Sumithraarachchi DBS.509, Tak 25 & 98, Tanaka & Shimada 10974, Tsang 25 & 98, Wu 1089, Yates 2525, and Ying 853 are *C. kaempferi* (Jacq.) Sieb.; Squires 828 is *C. palmatolobatum* Dop; Clemens & Clemens 3203 and Squires 363 are *C. paniculatum* f. *albiflorum* Mold.; Thomson & Hooker s.n. [cult., Plan. Ganget. Inf.] is *C. phlomidis* L. f.; Phengklai & al. 4225 is *C. urticifolium* (Roxb.) Wall.; and Saldanha 13681 is not verbenaceous.

Citations: PANAMA: Barro Colorado Island: Ebinger 40 (E--1772864, Mi, Mi, W--2560637, W--2560638); Tyson 4207 [ETC Label 1001 8 Feb. 55 (Teat)] (E--1836337). INDIA: Karnataka: Saldanha 13461 (W--2794821), 13681 (W--2653636). West Bengal: Helfer s.n. [Calcutta, 1836-38] (Go, S). State undetermined: Herb. Linnaeus G.810, S.5 (Ld--photo of type, Ls--type, N--photo of type). SRI LANKA: Amara-tunga 712 (Pd), 1848 (Pd), 2138 (Pd), 2291 (Pd); Gould 13588 (W--2574814A); Koyama 13553 (N, N, Pd); Moldenke, Moldenke, Dassanayake, & Jayasuriya 28333 (Gz, Ld, Pd, Tu, W--2764551), 28335 (Ac, E, Pd, W--2764549); Moldenke, Moldenke, & Jayasuriya 28257 (Ac, Gz, Kh, Ld, Pd, Tu, W--2764524); Moldenke, Moldenke, Jayasuriya, & Sumithra-rachchi 28120 (Ac, E, Gz, Kh, Ld, Pd, Tu, W--2764562); Mueller-Dombois 67052802 (W--2586011A); Sumithraarachchi DBS.422 (Ac, Gz, Lc, Ld, Lv, Tu, W--280832, Ws). BURMA: Tenasserim: Helfer 6050 (T). Upper Burma: Kingdon-Ward 9038 (N), 22573 (Go). CHINESE COASTAL ISLANDS: Hainan: Moninger 79 (Ph). THAILAND: Beusekom & Charoenpol 1922 (Ac); Boonchuai 1129 [Herb. Roy. For. Dept. 26393] (S); Bunnak 161 [Herb. Roy. For. Dept. 11523] (Ld); Charoenphol, Larsen, & Warncke 4116 (Ac), 4439 (Ac); Collins 2381 (W--1701706); Cunniff 47 (N); Geesink, Hattink, & Phengklai 6619 (Ac); Geesink & Santisuk 5297 (Ac); Iwatsuki, Koyama, Hutch, & Chintayungkun T.14515 (Ac); Larsen, Larsen, Nielsen, & Santisuk 31176 (Ac); Larsen, Smitinand, & Warncke 105 (Ac, Ld), 1356 (Ac, Ld); Maxwell 75-444 (Ac); Shimizu, Fukuoka, & Nalampoon T.7751 (Ac), T.7838 (Ac). VIETNAM: Annam: Clemens & Clemens 4383 (Ca--340344, Mi, N); Jacquet 595 (Ca--54814); Kuntze s.n. [III/75] (N); Squires 363 (La). Cochinchina: Docters van Leeuwen 4787 (Bz--20157); Squires 150 (Bz--20158, Ca--305925, N, Pd, W--1425726); Talmy s.n. [1868] (B); Thorel 726 (S). Tonkin: Pierre s.n. (B, Ca--54644). State undetermined: Groff, Herb. Canton Chr. Coll. 5672 (Ca--300168, Gg--32025). MALAYA: Pahang: Holt-tum 11485 (Bz--20153); Moysey 31054 (Bz--20152); Nur 32731 (Mi, W--2157497). Penang: Burkhill 6102 (Bz--20154, Bz--20155), 6132 (Bz--20156); Wallich 1802 (L). Singapore: Sinclair 4999 (W--2912696). TAIWAN: Beattie & Kurihara 10196 (W--1665504); W. Hancock 49 (Ca--288770); A. Henry 159 (W--455261), s.n. [Apr. 20] (N), s.n. [May 31] (N); H. W. Ream s.n. [May 14, 1958] (Ws, Ws); Sasaki 272 (Mi), s.n. [Herb. Govt. Formosa 21416] (Ca--344570, La), s.n. [Oct. 10, 1922] (Mi); Tanaka 106 (W--1528112), s.n. [1929] (S); E. H. Wilson 11134 (W--1052401). GREATER SUNDA ISLANDS: Batu: Raup 598 (Bz--20149). Java: Backer 3135 (Bz--20129), 4860 (Bz--20123), 12169 (Bz--20134, Bz--20135), 18851 (Bz--20124, Bz--20125, Bz--20126); Bijhouwer 211 (Bz--20136); Blume s.n. (N); Collector undetermined s.n. (Bz--20137, Ut--43900); Hallier s.n. [22-2-1896] (Bz--20127, Bz--20128); Hellen-doorn 12 (Bz--20122); Kollmann s.n. [Java] (Mu--836. M).

[to be continued]